

Mississippi River Hydrodynamic and Delta Management Study

NGO Briefing
25Sep2014

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South



US Army Corps of Engineers
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Study Reinitiation

- Rescoping
- Received an exemption from 3x3x3
- Study reinitiated on January 21, 2014

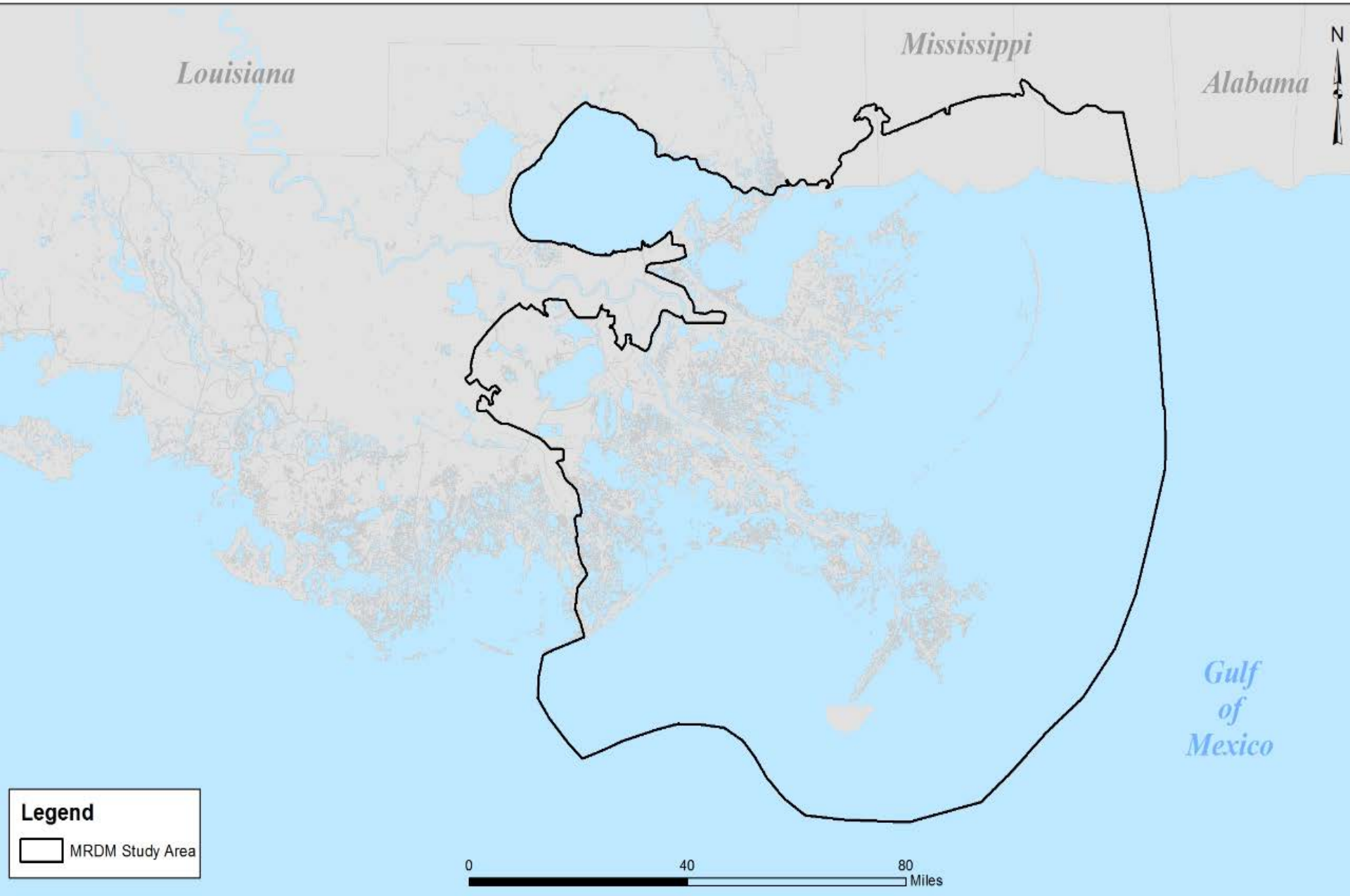


Study Status

- Developed and Screened the Initial Array of Measures and Alternatives to a Focused Array
- Developed technical scopes of work
 - AdH
 - Delft3D
 - EwE
 - CASM
- Alternative Milestone is October 27th
 - Concurrence from VT on Focused Array and Path Forward to TSP



LCA Mississippi River Hydrodynamic and Delta Management Study Area



Louisiana

Mississippi

Alabama

*Gulf
of
Mexico*

Legend

MRDM Study Area

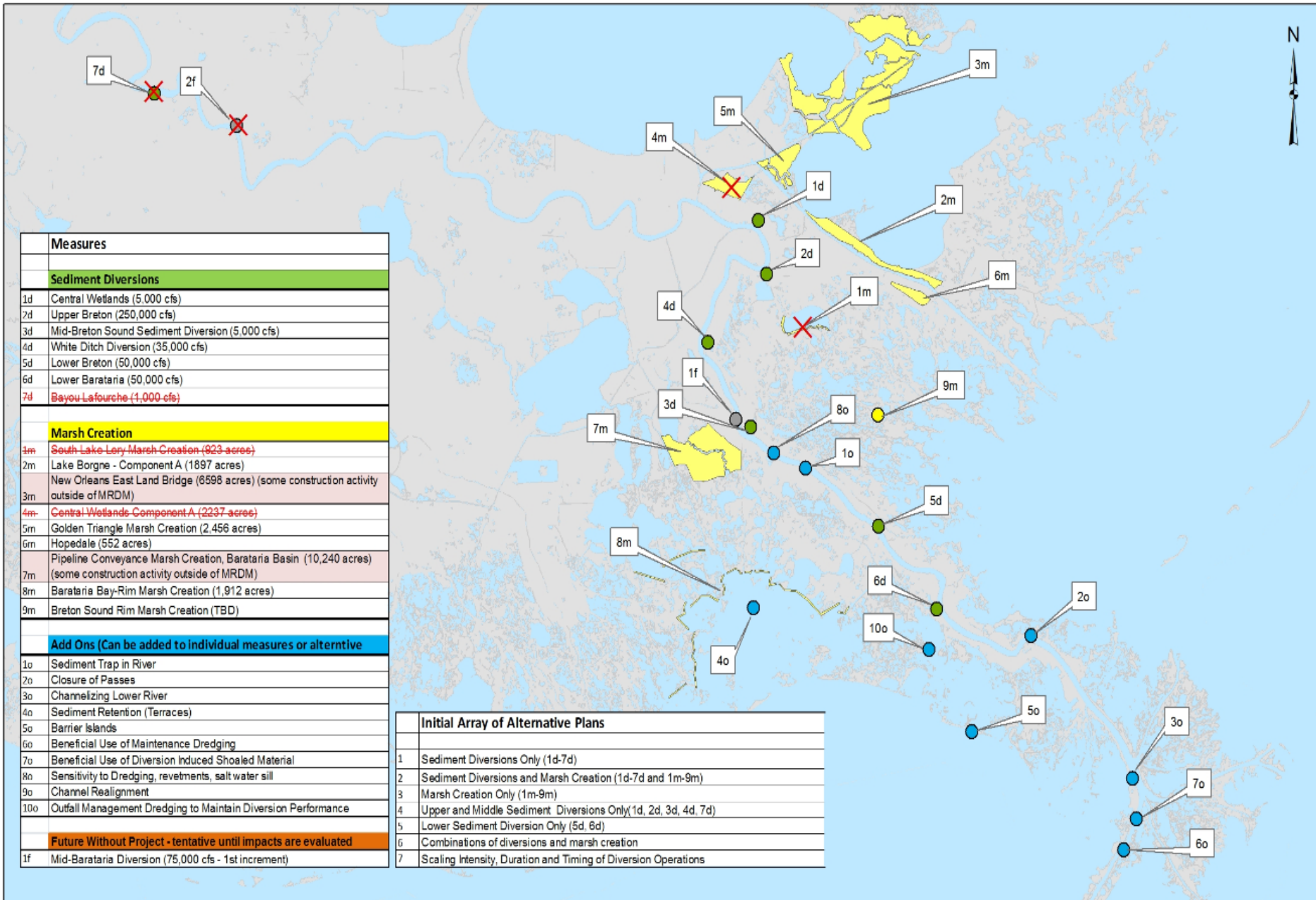
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Identifying Measures and Alternatives

- **Local Sponsor requested inclusion of Louisiana 2012 State Master Plan (SMP) “Final Array” of alternatives that use the MR as a sediment resource.**
- **PDT also brainstormed to consider new ideas.**
- **The measures and initial array of alternatives included the same operating plans/locations/assumptions as was evaluated in the Master Plan.**
- **The PDT will evaluate these assumptions further using refined models to select a TSP.**

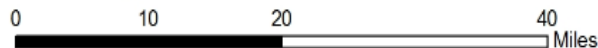


LCA Mississippi River Delta Management Study Initial Array of Measures/Alternatives



Measures	
Sediment Diversions	
1d	Central Wetlands (5,000 cfs)
7d	Upper Breton (250,000 cfs)
3d	Mid-Breton Sound Sediment Diversion (5,000 cfs)
4d	White Ditch Diversion (35,000 cfs)
5d	Lower Breton (50,000 cfs)
6d	Lower Barataria (50,000 cfs)
7d	Bayou Lafourche (1,000 cfs)
Marsh Creation	
1m	South Lake Lery Marsh Creation (923 acres)
2m	Lake Borgne - Component A (1897 acres)
3m	New Orleans East Land Bridge (6598 acres) (some construction activity outside of MRDM)
4m	Central Wetlands Component A (2237 acres)
5m	Golden Triangle Marsh Creation (2,456 acres)
6m	Hopedale (552 acres)
7m	Pipeline Conveyance Marsh Creation, Barataria Basin (10,240 acres) (some construction activity outside of MRDM)
8m	Barataria Bay-Rim Marsh Creation (1,912 acres)
9m	Breton Sound Rim Marsh Creation (TBD)
Add Ons (Can be added to individual measures or alternative)	
1o	Sediment Trap in River
2o	Closure of Passes
3o	Channelizing Lower River
4o	Sediment Retention (Terraces)
5o	Barrier Islands
6o	Beneficial Use of Maintenance Dredging
7o	Beneficial Use of Diversion Induced Shoaled Material
8o	Sensitivity to Dredging, revetments, salt water sill
9o	Channel Realignment
10o	Outfall Management Dredging to Maintain Diversion Performance
Future Without Project - tentative until impacts are evaluated	
1f	Mid-Barataria Diversion (75,000 cfs - 1st increment)

Initial Array of Alternative Plans	
1	Sediment Diversions Only (1d-7d)
2	Sediment Diversions and Marsh Creation (1d-7d and 1m-9m)
3	Marsh Creation Only (1m-9m)
4	Upper and Middle Sediment Diversions Only (1d, 2d, 3d, 4d, 7d)
5	Lower Sediment Diversion Only (5d, 6d)
6	Combinations of diversions and marsh creation
7	Scaling Intensity, Duration and Timing of Diversion Operations



Initial Screening Criteria

- **Objective Criteria**
 - **Acres created**
 - **Habitat Diversity (salinity shifts and HSIs)**
- **Constraint Criteria**
 - **River Impacts – sediment/dredging volume changes, stage decreases or increases, total water volume removed.**
 - **Basin Flooding Impacts – stage differences**



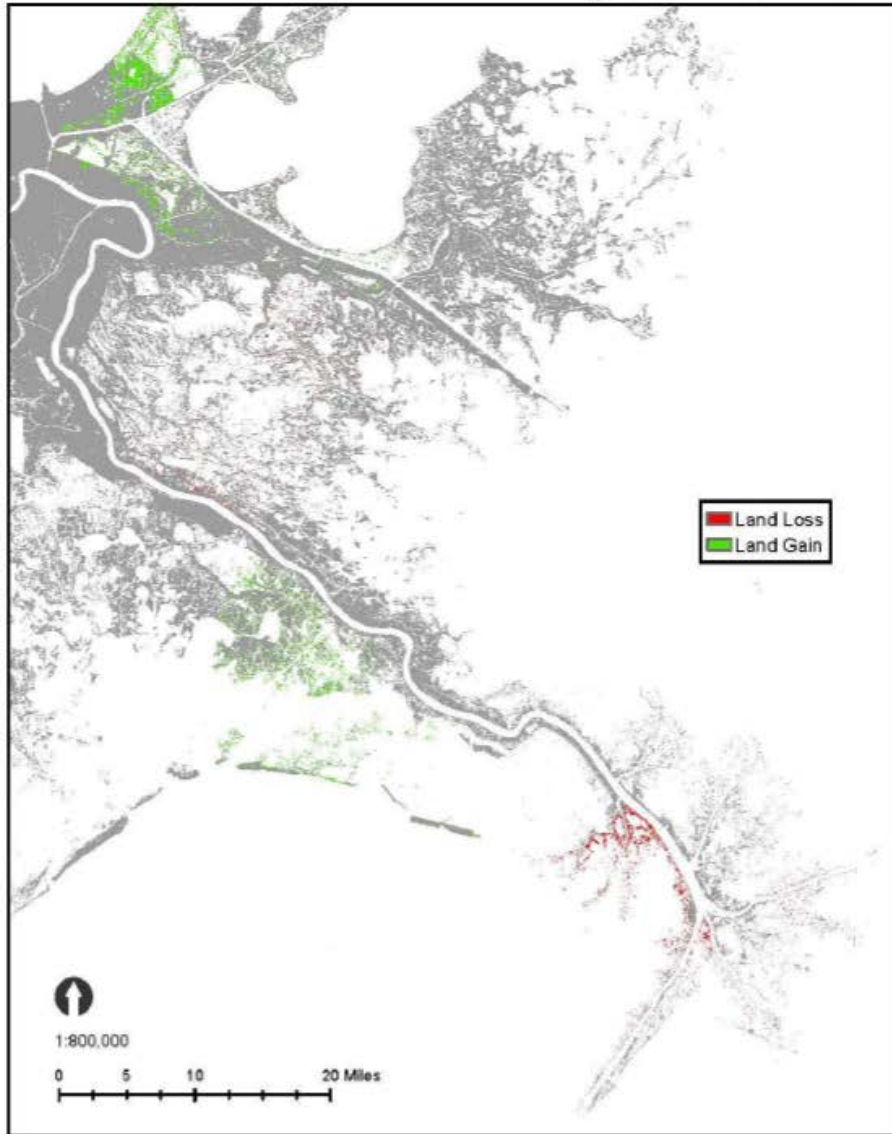
Methods and Models

- 2012 Louisiana State Master Plan Model Output
 - Acres, HSIs, Salinities, Basin Stage
- Hydrodynamic Study 1D River Models
 - Stage, Sediment/Dredging Volume Changes
- Analytic Methods and New AdH (screening level)
 - Acres, Salinities, Stage
- Existing LCA Models
 - White Ditch, Myrtle Grove
 - Salinities, Stage

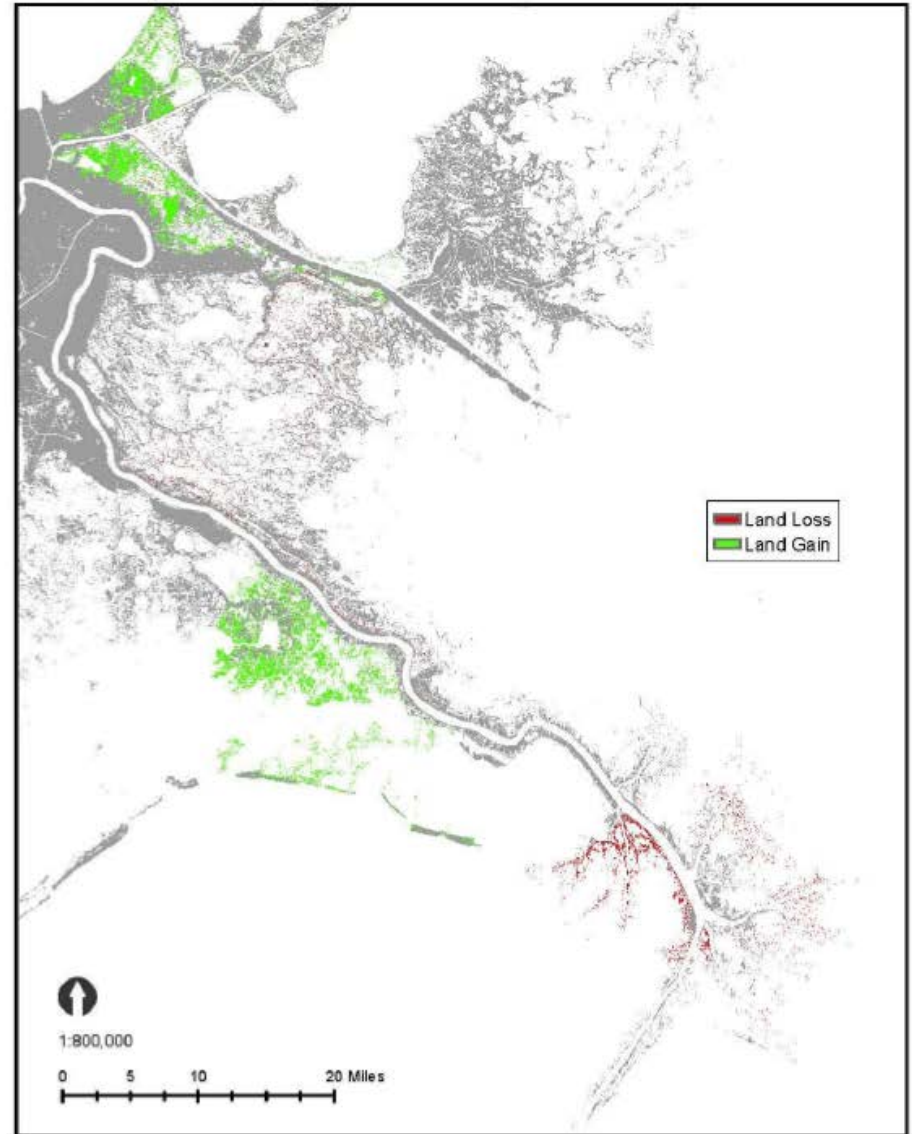


Lower Barataria: Land Moderate Scenario

(FWP - FWOP for Land / Water, 30 m grid)



Year 25



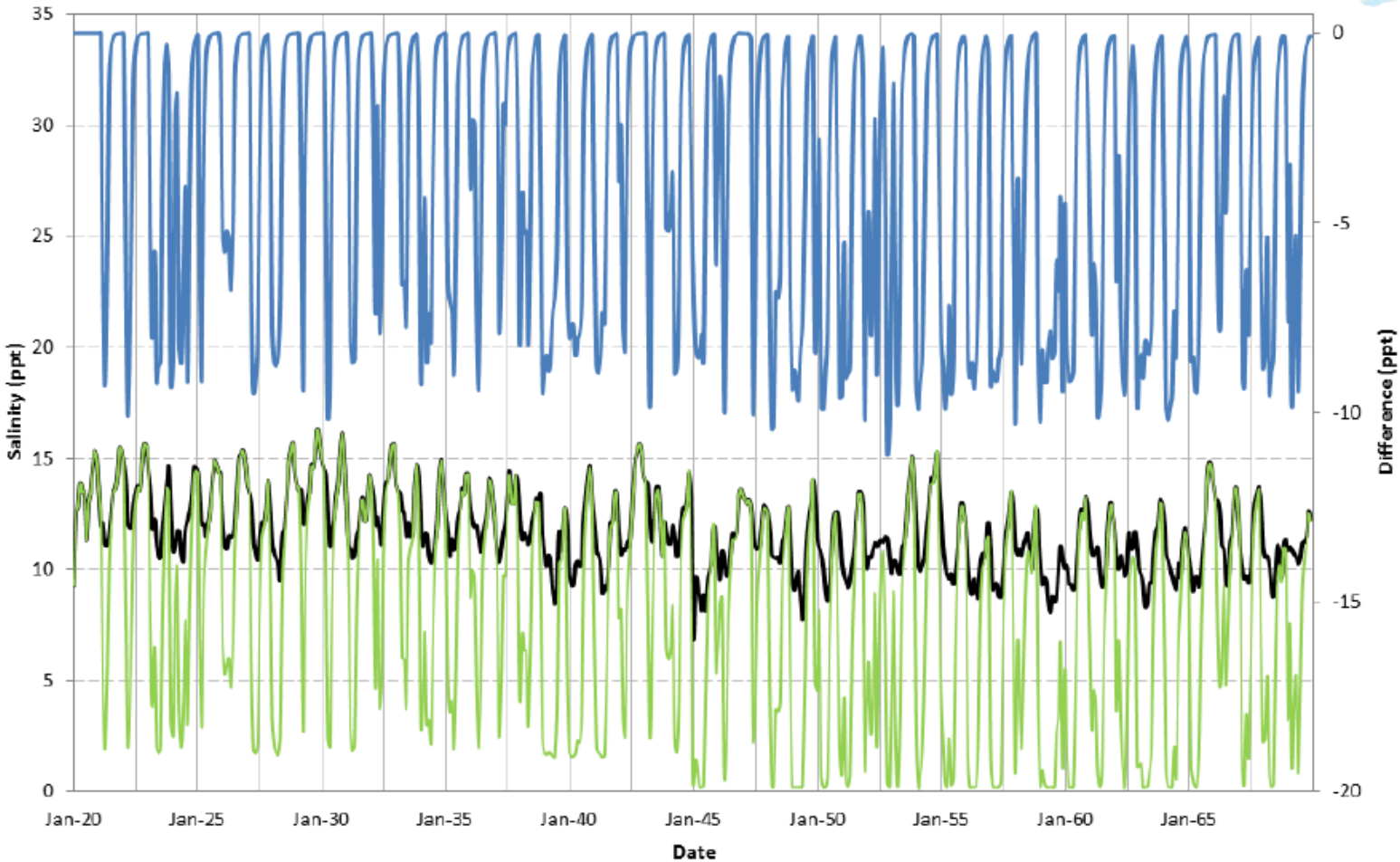
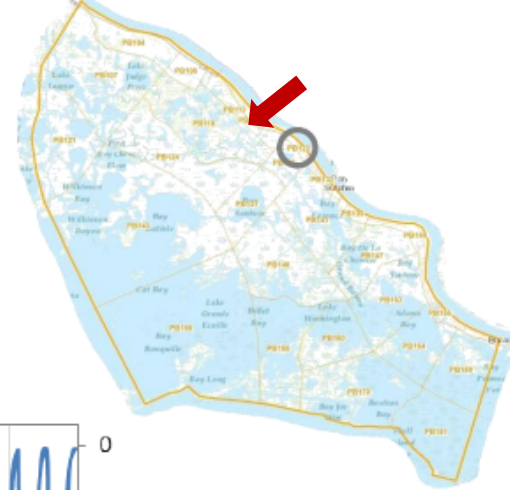
Year 50

*Lower Barataria - 002.D1.15 - G14 Model Group includes other projects

Lower Barataria: PB039

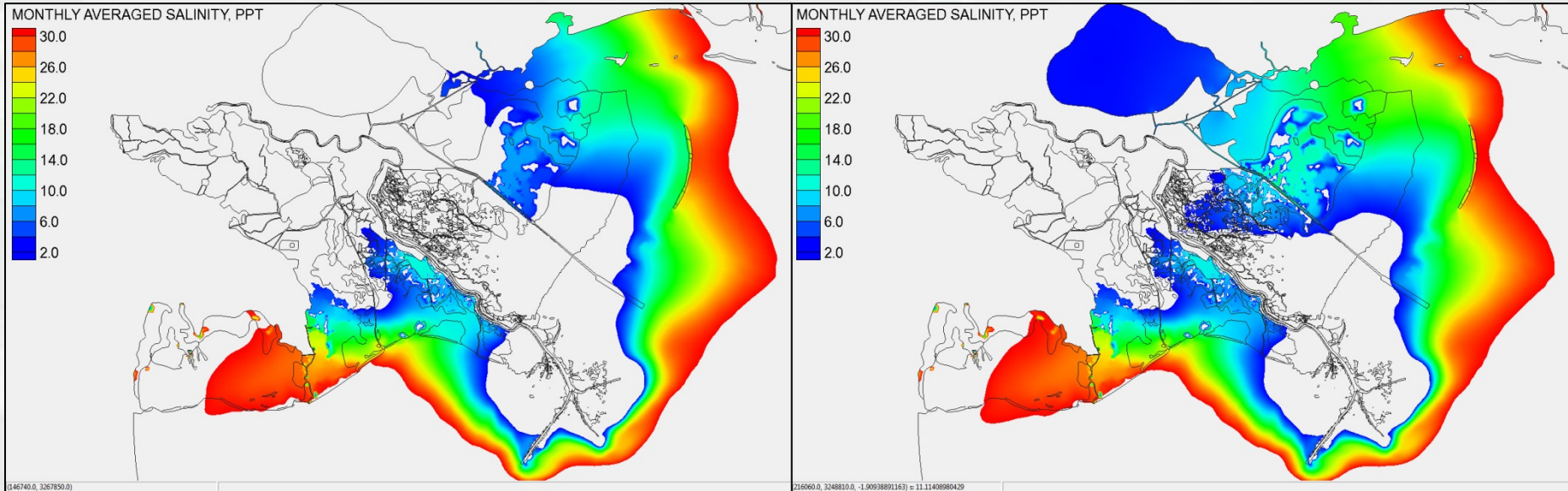
Magnolia Alternative

Salinity Comparison Monthly Average



— FWOP - G01 - PB122 - River Adjacent (Middle) — Alt - G10 - Magnolia - PB122 - River Adjacent (Middle) — Difference (Alt - FWOP)

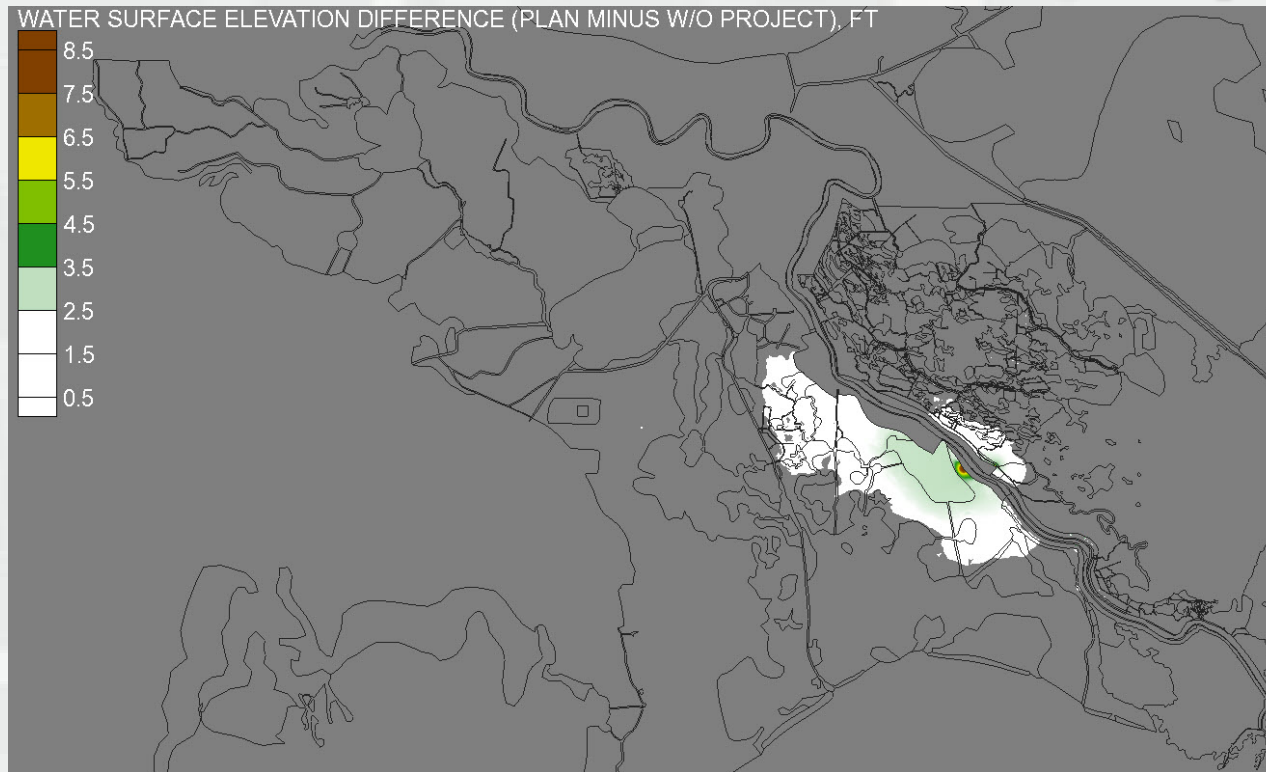
Month-Averaged Salinity: June



Run3: Upper Breton Sound



Water Surface Elevation Impacts



Run6: Lower Barataria and Lower Breton



Screened Measures/Plans

- **Diversions**
 - **Upper Breton Sound Diversion screened (moved to future implementation) based on basin flooding and habitat diversity impacts.**
 - **Central Wetlands screened based on basin flooding, and low acres.**
- **Marsh Creation**
 - **Barataria Bay Rim and Breton Rim screened because of SLR impacts, and sustainability.**
 - **Hopedale screened because of low acres, least benefit to system and land locked.**
 - **Lake Borgne, NO East, and Golden Triangle were screened because of proximity to diversion influence areas.**



Pertinent Screening Information

- **New Marsh creation sites were added in the same footprint as diversion land building.**
- **The team will make direct comparisons of diversions to marsh creation keeping as many variables constant as possible (including the sediment resource/bar in the river).**
- **Outfall management add ons will be included in sensitivity analysis of the focused array of alternatives to optimize diversion performance.**
- **Diversion induced shoaled material will be utilized for outfall management/marsh creation.**



Louisiana Coastal Protection
and Restoration Authority



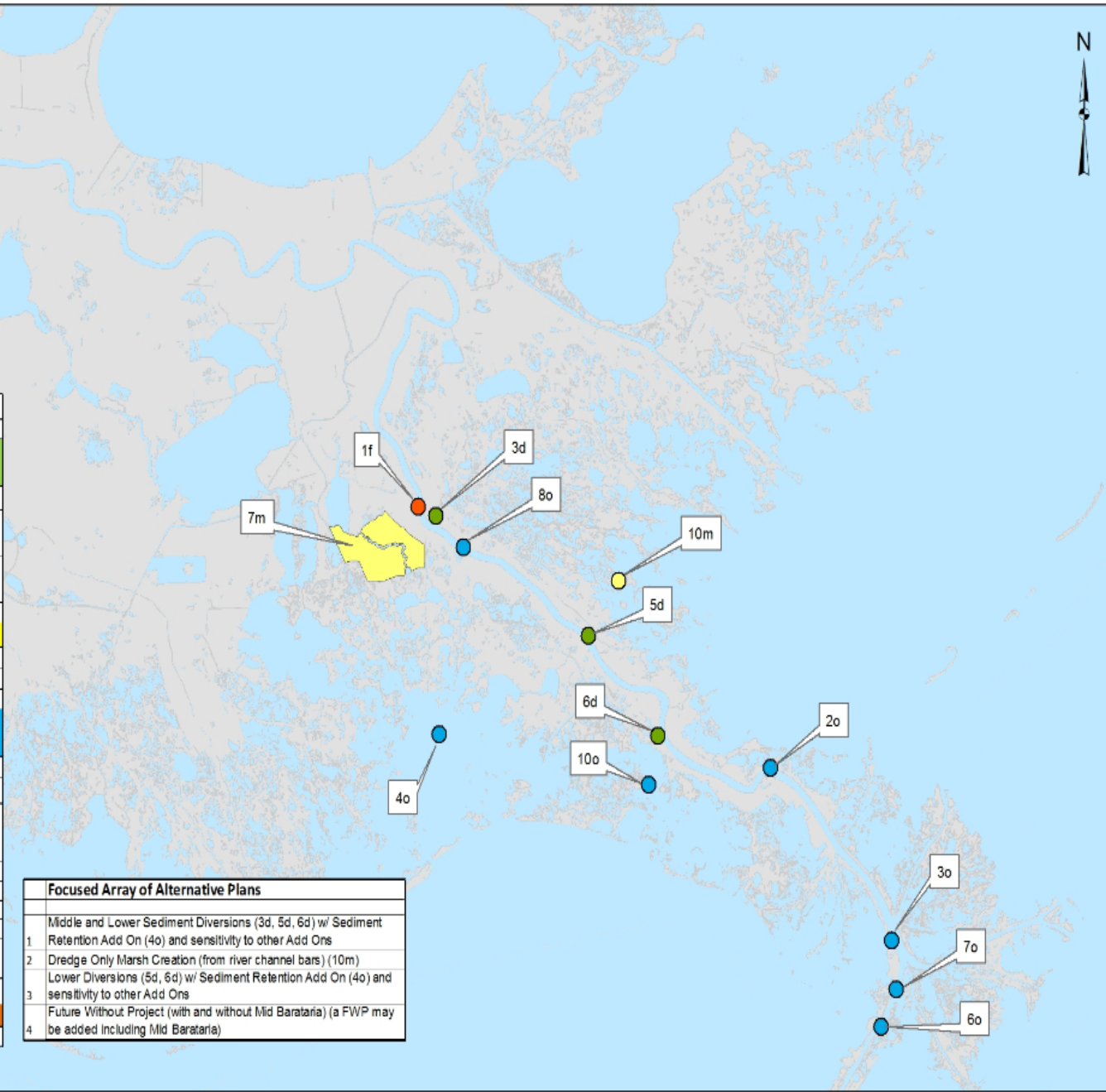
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LCA Mississippi River Delta Management Study Focused Array of Measures/Alternatives



Measures	
Sediment Diversions	
3d	Mid-Breton Sound Sediment Diversion (5,000 - 35,000 cfs)
5d	Lower Breton (50,000 cfs)
6d	Lower Barataria (50,000 cfs)
Marsh Creation	
7m	Pipeline Conveyance Marsh Creation, Barataria Basin
10m	New Marsh Creation Sites to Compare to Diversions
Add Ons - Features to Optimize Performance (Can be added to individual measures or alternative plans)	
2o	Closure of Passes (Fort St. Phillip)
3o	Channelizing Lower River
4o	Sediment Retention (marsh creation, rims, terraces, SREDS, islands, reefs, etc.) sediment source is river shoaling, bars, or outfall management dredging to maintain diversion performance.
6o	Beneficial Use of Maintenance Dredging
7o	Beneficial Use of Diversion Induced Shoaled Material
8o	Sensitivity to Dredging, revetments, salt water sill
9o	Channel Realignment
10o	Outfall Management Dredging to Create Marsh and Optimize Diversion Performance
Future Without Project - tentative until impacts are evaluated	
1f	Mid-Barataria Diversion (75,000 cfs - 1st increment)

Focused Array of Alternative Plans	
1	Middle and Lower Sediment Diversions (3d, 5d, 6d) w/ Sediment Retention Add On (4o) and sensitivity to other Add Ons
2	Dredge Only Marsh Creation (from river channel bars) (10m)
3	Lower Diversions (5d, 6d) w/ Sediment Retention Add On (4o) and sensitivity to other Add Ons
4	Future Without Project (with and without Mid Barataria) (a FWP may be added including Mid Barataria)



Screening of Focused Array to a TSP

Developing the Science

- 2 multidimensional numerical models addressing local and system wide hydrodynamics, salinity, sediment dynamics, morphological characteristics, nutrient dynamics, and ecosystem dynamics.
 - AdH/SEDLIB – 2D depth-averaged mode with quasi 3D sediment behavior.
 - Primary Productivity Model included in SEDLIB
 - Simplified Box Model for water quality constituents
 - Delft 3D
 - Data Collection
 - Marsh Elevation, Bathymetry , Meteorological , Stage, Temperature, Velocities, Chlorophyll a, DO, Salinity, Turbidity, Above and Below Ground Biomass/Soil Organic Matter/Mineral Sediment Content/Soil Strength
 - Developing a Wetland Soil Model Component
 - Nutrient Dynamic and Morphodynamic Module



Screening of Focused Array to a TSP Developing the Science

- 2 Ecological (primarily fisheries) Models
 - Ecopath with Ecosim (EwE)
 - Open source ecosystem modeling software, originally developed by Polovina ([1984](#)) to model trophic interactions and to estimate mean annual biomass of the French Frigate Shoal coral reef ecosystem.
 - These models are Mass-balanced (Ecopath), time-dynamic (Ecosim) and spatially explicit (Ecospace)
 - Comprehensive Aquatic System Model (CASM)
 - Determine effects of large scale river diversions and other project features on economically and ecologically important fish and shellfish species in Pontchartrain and Barataria Basins.



Delta Management Milestones

- FCSA Signed 24 Aug 2011
- National Planning Charette 15-19 Oct 2012
- Waiver Approved 29 Jul 2013
- Develop Initial Array of Alternatives 24 Apr14
- Screen Initial Array of Alternatives 15 Aug 2014
- **Alternatives Milestone IPR #1 15 Oct 2014**
- **Tentatively Selected Plan Milestone Meeting #2 19 Aug 2015**
- Agency Decision Milestone Meeting #3 25 Mar 2016
- Final Report Submittal 04 Jul 2016
- Civil Works Review Board #4 16 Sep 2016
- Chief's Report Milestone #5 16 Dec 2016



Questions?

